

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1-13. (Canceled)

14. (Currently Amended) A method for screening compounds for biological activity and/or toxicity comprising adding a compound to an apparatus which comprises:

a nanoporous silicon support comprising a plurality of nanopores,

a plurality of macrowells disposed on the nanoporous silicon support,

and

at least one cell within one of said plurality of macrowells,

contacting the at least one cell within one of said plurality of
marcrowells with a compound; and

monitoring the at least one cell for a change in biological activity or
toxicity;

wherein the at least one cell is in contact with the nanoporous silicon support and is provided with nutrients and oxygen sufficient to maintain the viability of the at least one cell and the nanopores do not allow the at least one cell to pass through the nanoporous silicon support, and the at least one cell is monitored for changes in response to addition of the compound wherein a change in biological
activity or toxicity is indicative of a compound that has an effect of the biological
activity or has a toxic effect on the cell.

15. (Previously presented) The method of claim 14, wherein the plurality of macrowells have a diameter between 0.2 and 200 microns.

16. (Previously presented) The method of claim 14, wherein the plurality of macrowells have a diameter between 0.2 and 150 microns.

17. (Previously presented) The method of claim 14, wherein the plurality of macrowells have a diameter between 15 and 25 microns.

18. (Currently Amended) The method of claim 14, wherein the at least one cell is a cells-are eukaryotic cell[[s]].

19. (Currently Amended) The method of claim 14, wherein the at least one cell is a cells-are hepatic cell[[s]].

20. (Currently Amended) The method of claim 14, wherein the at least one cell is a cells-are prokaryotic cell[[s]].

21. (Previously presented) The method of claim 14, wherein the plurality of macrowells are coated with a coating substance selected from the group consisting of biomolecules, peptides and proteins that promote cell adhesion on biocompatible polymers.

22. (Original) The method of claim 21, wherein the coating substance is selected from the group consisting of collagen, fibronectin, vitronectin, RGD and YIGSR peptides, GAGs, HA, integrins, selectins and cadherins.

23. (Previously presented) The method of claim 14, wherein the plurality of macrowells are prepared using a method selected from the group consisting of micromolding, electrodeposition machining, laser ablation, laser drilling, micromachining, wet etching, reactive ion etching, LIGA and embossing.

24. (Previously presented) The method of claim 14, wherein the at least one cell is perfused with culture medium or buffered saline solution.

25. (Original) The apparatus of claim 14, wherein the direction of perfusion is in any orientation relative to the support.

26. (Original) A method of claim 14, wherein multiple compounds are screened simultaneously for interactions.

27. (Currently Amended) A method for screening a compound for at least one activity under physiological conditions ~~in a microarray comprising~~

exposing at least one cell to a compound in an apparatus which comprises a nanoporous silicon support and a plurality of macrowells disposed thereon, the at least one cell within one of said plurality of macrowells,

wherein the nanoporous silicon support allows the at least one cell to obtain nutrients and oxygen sufficient to maintain the viability of the at least one cell ~~exposed to a compound to be tested and~~

measuring a change in at least one activity of the cell, wherein a change is indicative or a compound that has an effect on the at least one cell screened for at least one effect of the compound on the at least one cell.

28. (Withdrawn) A method for analysis of metabolism of a compound comprising

exposing cells in an apparatus which comprises a nanoporous silicon support comprising a plurality of macropores which support the viability of cells, at least one individual cell within one of said plurality of macropores,

wherein the support allows the cells to obtain nutrients and oxygen sufficient to maintain the viability of the cells exposed to a compound that may be metabolized by the cells,

wherein the nutrients are provided by the culture medium, and

wherein the metabolized compound is recovered from the culture medium for analysis.

29. (Withdrawn) A method for protein production comprising exposing cells in an apparatus which comprises a nanoporous silicon support comprising a plurality of macropores which support the viability of cells,

at least one individual cell within one of said plurality of macropores,

wherein the support allows the cells to obtain nutrients and oxygen sufficient to maintain the viability of the cells expressing protein,

wherein the nutrients are provided by the culture medium, and

wherein the expressed protein is recovered from the culture medium.

30. (Withdrawn) A method to provide hepatic support comprising exposing cells in an apparatus which comprises a nanoporous silicon support comprising a plurality of macropores which support the viability of cells,

a plurality of hepatocytes within said plurality of macropores,

wherein nutrients are provided by the blood or serum, and

wherein the support allows passage of blood or serum to allow bidirectional mass transfer of large molecular weight proteins sufficient to allow the fluid to be processed by the hepatocytes.